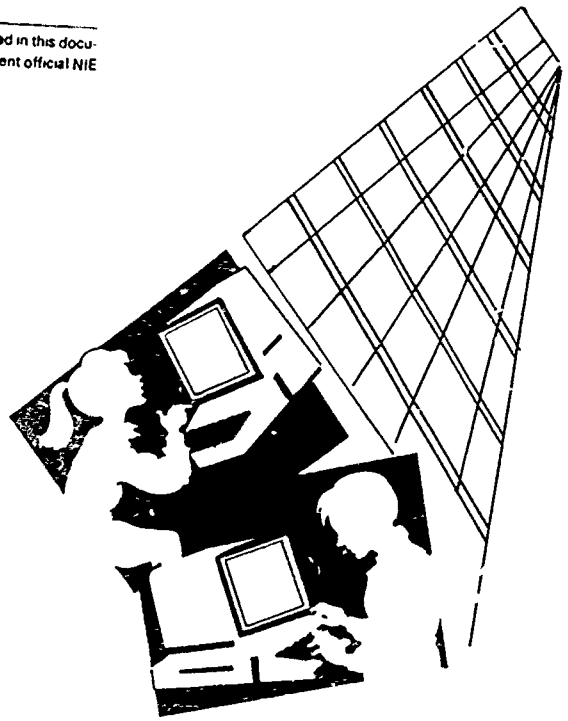
DOCUMENT RESUME

ED 263 872 IR 011 823

TITLE	Technology Applications in Basic Skills (TABS). Year One Report-1984. Executive Summary.
INSTITUTION	Merrimack Education Center, Chelmsford, Mass.
SPONS AGENCY	Office of Educational Research and Improvement (ED), Washington, DC. Center for Libraries and Education Improvement.
PUB DATE	1 Jan 85
NOTE	17p.; For related document, see IR 011 822.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Basic Skills; *Computer Literacy; *Curriculum Development; Curriculum Evaluation; *Educational Technology; *Federal Programs; *Instructional Improvement; Instructional Innovation; Junior High Schools; *Microcomputers
IDENTIFIERS	Computer Uses in Education

ABSTRACT

This executive summary presents information on the design rationale, project coordination, and findings for the first year of the Technology Applications in Basic Skills project (TAES), which was administered by the Merrimack Education Center and designed to implement programs that use the computer and related technologies to increase student competencies in the basic skills areas of writing, problem solving, and research/study skills in grades 6 through 8. The issues addressed in the first year of the project are presented in this report, which describes: how the project was planned and implemented by the Merrimack Education Center with the staff from three school sites in Burlington, Lunenburg, and Tewksbury, Massachuetts; how a program development model was chosen; the major elements of the project design; year one activities; and resulting curriculum changes in each of the three school sites. Ten major findings from year one are listed, and it is concluded that the existing basic skills curriculum often is not configured to make maximum utilization of technology, and that staff uncertainty about the new technologies leads to initial confusion about staffmember roles, lack of focus in the curriculum target area, and negative perceptions about lack of incentives and burdens of time. It is suggested that teachers need to broaden their view and perspecitve of technology in the curriculum and create new contexts for the skills development that is necessary to make appropriate and meaningful uses of technology in the schools. (JB)



TECHNOLOGY APPLICATIONS IN BASIC SKILLS (TABS)

YEAR ONE REPORT — 1984

EXECUTIVE SUMMARY

Submitted to:

Division of Education Technology
U.S. Department of Education
Washington, D.C.

Submitted by:

Merrimack Education Center
101 Mill Road
Chelmsford, MA 01824
(617) 256-3985

January 1, 1985

TECHNOLOGY APPLICATIONS IN BASIC SKILLS (TABS)
YEAR ONE REPORT — 1984
EXECUTIVE SUMMARY

INTRODUCTION

Technology Applications in Basic Skills (TABS) is a project of the Merrimack Education Center designed to implement programs that use the microcomputer and related technologies to increase student competencies in the basic skills areas of writing, problem-solving and research/study skills in the middle school (grades 6 through 8). The purposes of the project are to: (1) develop a comprehensive process for integrating technology into the curriculum; and (2) develop replicable programs that use microcomputer technologies to enhance instruction in three basic skills areas. The project addresses the issues associated with efforts to introduce computer technology into the instructional program of the typical junior high or middle school.

The project is designed to yield benefits in the effective use of educational technology for school improvement at three levels:

- Teachers and students will develop new skills and competencies in computer utilization; students will improve their basic skills in the areas of writing, problem-solving and research/study skills.
- All district staff will have a model to use in developing a district-wide computer instruction program.
- The integration of computer technology into the total curriculum will support school improvement efforts in the area of basic skills.

The Technology Assistance in Basic Skills project began in January, 1984, in the three communities of Burlington, Lunenburg and Tewksbury, Massachusetts. Each of these districts agreed to examine the integration of technology within the curriculum of their middle schools. These three school sites were selected for the development and implementation of the technology project for writing, study skills, and for problem-solving, respectively. While all schools address a target population of grades six, seven and eight, the districts vary in size, wealth and level of technology use.

The purposes of this case study are to provide descriptive documentation of project activities and services, as well as a formative assessment, based chiefly on descriptive data, of the implementation of the project during the first year. The issues addressed in the first year of the project are fully presented in this report, describing how the project was planned and implemented by the Merrimack Education Center with the staff from three school sites. Project documentation focused on the relationships of linkage, structure, and capability of schools to perform with the new technologies and the transfer of technology into school settings. This assessment resulted in recommendations for strategies and services, including preparation of the evaluation design and research activities for 1984-1985 school year.

PROJECT RATIONALE AND DESIGN

The rationale for this project is that the most appropriate and meaningful uses of technology will be realized when technology is used as a tool to support a revitalized curriculum across all or most content areas This rationale is based on our observations and assessment of the state of the art with respect to technology applications in education and our experience in helping over fifty school districts to implement technology. By and large we found that applications were fragmented, uncoordinated and separated from the total school curriculum. Concurrently, we observed that, as documented by the many national reports and studies, curriculum revitalization and educational reform in general were very much needed. We viewed these two sets of observations as mutually compatible and reinforcing. The Technology Applications Project was designed to address both at once.

Appropriate and optimum uses of technology require a strong curriculum. To use even the best technology to deliver an outmoded curriculum will impede the realization of our most important educational goals.

The project is addressed to the following questions:

- How can existing curricula be designed to accommodate and make maximum use of technology, particularly microcomputer and minicomputer-based education?
- How can the computer be used as a catalyst to revitalize existing curricula across all basic skill areas?

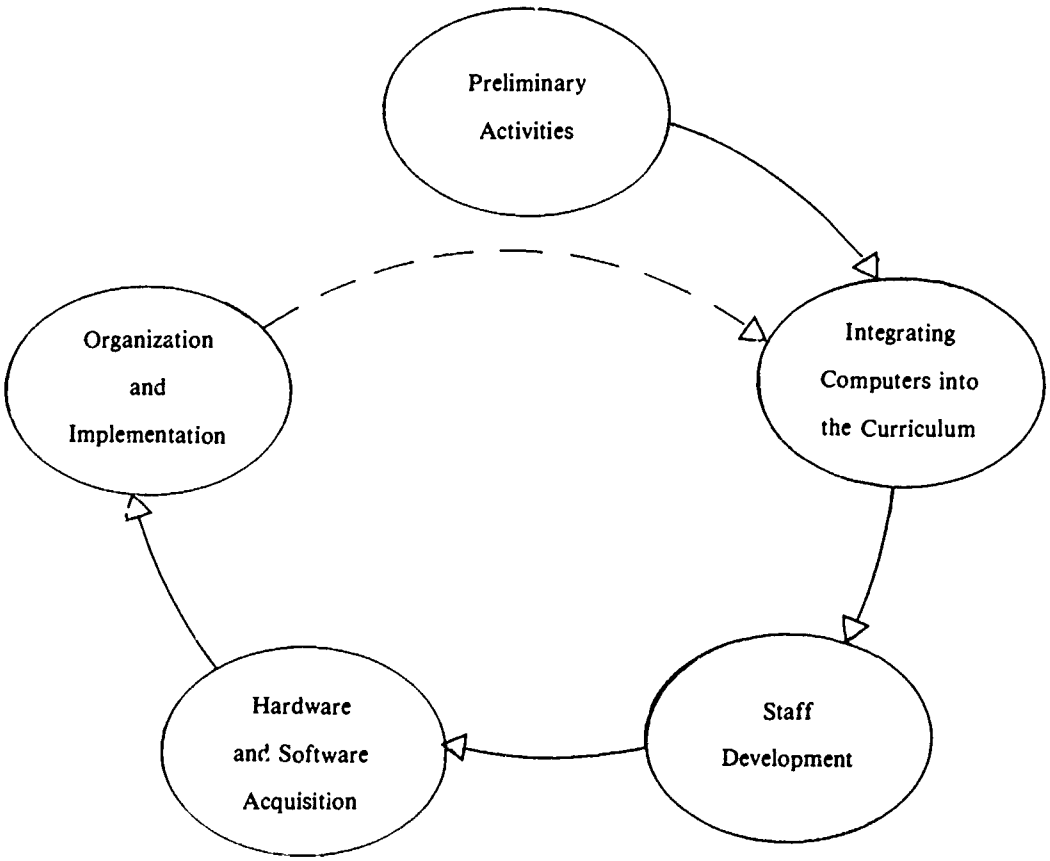
- What configurations of hardware and software are most appropriate to carry out instructional tasks?
- What instructional delivery systems and instructional strategies make maximum use of technology?
- What staff development and support models are most appropriate for local school implementation?

The program development model employed in this project for Technology Applications in Basic Skills is a relatively traditional one with certain components being emphasized. It is essentially a curriculum-driven model, as distinct from a technology-driven one. In addition, a heavy emphasis is placed on staff development so that faculty can understand and practice the uses of technology. Implementation support is provided throughout this process. The technology applications model was derived from the Computer Applications Planning (CAPS) process designed by the Merrimack Education Center Lighthouse (see Figure 1).

Our implementation of the model has been undertaken in the middle school (grades 6 through 8) in the three school districts. Each school has selected a different area of the basic skills curriculum in which to work. In all three sites the major effort began with examining the basic skills curriculum so that it could fully and appropriately exploit the capabilities of technology. This curriculum revitalization has stimulated extensive staff development for the teachers, including graduate level coursework, to bring their technological and curriculum implementation skills up to a level sufficient to work with their students in this demonstration project.

FIGURE 1

COMPUTER APPLICATIONS PLANNING



The major elements of the project design involved:

(1) incorporating new teacher role expectations;

(2) including qualitative and quantitative measures of student performance as detailed in the evaluation design; and

(3) refining and verifying the focused curriculum objectives so that technology could be applied.

To manage the technology implementation in different school settings and achieve improved student performance are tasks of great scope and are dependent upon:

(a) the selection of appropriate evaluation instruments;

(b) a setting and organizational structure conducive to change, including administrative support from central office; and

(c) capabilities and expertise in both technology/technical skills and curriculum development. Thus, the instructional systems design was important to the technology implementation.

YEAR ONE ACTIVITIES

Year one activities included staff development, curriculum revision, hardware and software selection, development and implementation of instructional modules, and development of a formative and summative evaluation design.

The staff development program focused on technological literacy, instructional design and development, and practical experiences. The training sessions dealt with the development of process skills for each basic skills area (writing, study skills and problem-solving) and with computer applications to assist in developing these skills. These sessions were conducted for the project staff of each school. Based on these training sessions, district staff then developed sets of lessons, or instructional modules, that integrated hardware and software with a corresponding area of the curriculum. A module design was developed for application in the three

districts across the different curriculum areas. The purpose of these initial efforts was to determine what constitutes a productive application of technology in the curriculum and to pilot these activities in the spring of 1984.

School district staff not only selected technology software for use in the integration, but at the same time restructured their curriculum around appropriate discipline-specific procedural skills. This resulted initially in an added time burden, but was an important step in the preparation of lessons as the curriculum was revised or modified for application with the technology. The scope and sequence of the curriculum began to take on new dimensions, in an evolutionary sense, as the demonstration lessons and activities were created and used to determine how best to apply the software at each of the school sites.

BURLINGTON SITE

In the Burlington Public Schools, the writing curriculum has been revised and strengthened, incorporating the principles and practices established in the NDN* New Jersey Writing Project and in the literature of Graves, Murray and Applebee, among others. Working in both classroom and computer lab settings, students use a variety of word processing software (e.g., Bank Street Writer, Write Stuff and Milliken's Word Processor), as a tool to prepare their written work. Teachers use classroom instruction and effective teaching strategies to promote written language development.

*NDN-National Diffusion Network

Writing instruction is delivered in both a computer laboratory and in an open classroom setting with an integrated language arts curriculum. After instructional teams and classroom assignments were scheduled, the teams of teachers set up time blocks for the written language instruction as part of the language arts time, with some classes being taught in the computer lab. In addition, non-computer time is included in the writing lessons for pre-writing activities, particularly planning and organizing, before access to the computer by each student. Five of the six participating teachers are scheduled into the computer lab with their classes for 50-minute blocks each week. Computer labs help students to work on writing assignments at various times, individually scheduled by classroom.

LUNENBURG SITE

The Lunenburg site is addressing the complex task of using technology to support the teaching of study/research skills in several content areas. Based on a range of available study skills programs and materials, the project uses database management and communications software tools to support comprehensive instructional units. Related support software is used as appropriate.

A scope and sequence of study skills were prepared, and participating teachers in grades 6, 7, and 8 included study skills in their daily lesson plans. The initial work emphasized study skills in teaching the content areas of reading/language arts, social studies and science. Participating teachers reviewed extensive collections of software and identified programs for part of their regular curriculum during the implementation of this project.

In the fall, 1984, semester, eighth grade students completed an introductory unit in their year-long study of energy conservation. The first lessons used the software program, Geology Search (McGraw Hill), and emphasized study skills. Students in grade six social studies used prepared materials with the National Geographic videodisc on Whales and applied study skills in note-taking, comparing and contrasting information, and categorizing and compiling files of information. The Voyage of the Mimi, created by the Bank Street College Science and Mathematics Education Program, was used with students to master study skills in applying the scientific method. Another grade six class used the Archeology Search software (McGraw Hill) to apply their study skills. In the seventh grade, students in communications class explored library skills and locating reference sources through the Britannica Library Skills software and the Elementary Library Media Skills software distributed by Combase.

TEWKSBURY SITE

The science curriculum in Tewksbury has been restructured to focus on problem-solving processes and on related procedural knowledge and skills, using microcomputers as learning tools. The restructuring was accomplished by the participating teachers and incorporates all or most of the subject matter previously covered in the eighth grade physical science course. This new approach is consistent with the recommendations of recent studies of math and science curricula, and uses as an instructional framework the generic process steps of the problem-solving process.

In 1983, students in grade 6 received computer literacy instruction so that students entering the Tewksbury Junior High School in 1984 already had the essential prerequisite computer skills. The Junior High School has established goals to teach keyboarding skills in grades 7 and 8 using manual typewriters, and to begin programming in computer science education. Instructional modules will be developed in all areas of the curriculum eventually, but through this project, attention will be given first to integrating the computer competencies into the science program. This is seen as a way to revitalize the science program at the middle school level. Tewksbury students use spreadsheet and database software, as well as laboratory simulations and probes, tutorials and demonstrations to support the teaching of problem-solving concepts in science.

Instructional delivery is within regularly assigned science classes. Entire science classes go into the computer lab together, although some students may not participate in all of these assignments. Some activities, such as using measuring probes as accessories to the microcomputer, are employed for demonstration in the science classroom. While different teachers have different levels of proficiency and comfort with computers, all eighth grade science classes are participating.

PROJECT COORDINATION

The Merrimack Education Center provides overall project coordination, including intersite communications. MEC also provides the following services:

- Staff Development. — MEC identifies resource persons and designs and schedules training sessions. MEC staff sometime conduct training sessions.
- Implementation Support. — MEC staff work closely with the site coordinators to identify ongoing needs and to monitor the implementation of instructional modules.
- Documentation. — MEC staff work with the site coordinators to document all project activities and materials. An implementation guidebook will be a major second year product.
- Evaluation. — MEC is coordinating the conduct of the evaluation of all three projects by an external consultant. The evaluation design will yield information for the preparation of a JDRP* application for each of the three project sites.

*JDRP — Joint Dissemination Review Panel

YEAR ONE FINDINGS

Based upon activities and accomplishments to date, we have realized several preliminary findings that are validated by research and experience:

1. The power of the computer can be more fully realized when used as a tool rather than as a teaching device, although the distinctions between the two modes are blurred in some applications.
2. The curriculum review time required is often underestimated in schools when integrating interactive technology. Wholesale adoption of existing NDN projects was not possible because of inappropriate matches, or time and resource constraints.
3. The amount of staff development time required to develop a level of comfort with technology may be underestimated by schools. Teachers require considerable support in order to prepare instructional units that incorporate technology applications.
4. Technology is a stimulus to rethink what are truly the "basic" skills in education for the 1980's and 1990's. Basic skills include learning to use the computer: e.g., data bases, editing text, and the like.
5. Preparatory training for students on technical skills is essential. For this reason, all project sites prepared a program of 15 hours of classroom instruction in preliminary computer activities using the COMPUTER CONCEPTS* software with groups of students and for individual practice. This software was also used to give students computer time in another subject area or in a general literacy program so that the project might continue with more sophisticated applications. Major recommendations in the areas of keyboarding and introductory concepts were made that have affected the entire student population at each of the schools.

*TM — Continuous Learning Corporation, Cambridge, MA

6. In instances where there are limited computer stations, scheduling problems may be encountered in implementing a comprehensive project. Two of the three schools doubled their available equipment for the implementation phase to overcome this constraint. In all three sites advanced scheduling by the administration gave priority to meeting the needs of the project.

7. In the early phase of installation, computer utilization favors a laboratory setting rather than classrooms for several reasons, not the least of which are the instructional management demands placed on the classroom teacher.

8. Instructional management and grouping modes are two factors that have a great impact on classroom settings and program success.

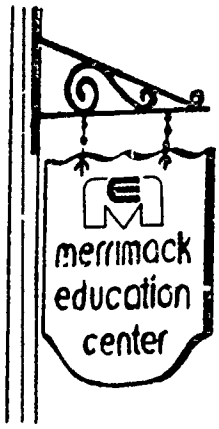
9. Content and process skills need definition and integration in the curriculum. The operational definition of problem-solving, for example, was selected using the OISE* framework and using those specific items selected with the evaluator for the research and testing phase. Generally, those teachers already "process-oriented" tend to accept the process approach more readily and to proceed further in implementation of problem-solving or other higher-order skills.

10. Internal factors of structure and organization of the school have varying consequences on the diffusion of technologies in their different settings; thus, the internal capability of the resource system of the school districts contributes to the implementation effort. Linkage between the school districts and the project at MEC is positively related to diffusion of technology. The site coordinators facilitate linkage between the MEC staff and the school and they contribute to the internal capability of the school district.

*OISE — Ontario Institute for Studies in Education

We have found that technology can serve as a powerful lever to revitalize what we teach as well as how we teach it. We have found that many times the simple technology tools that are available — often those without all the glamour of more complex software — can be used effectively to help students extend their learning capacities and be more productive.

An important learning from the first-year activities is that the existing basic skills curriculum often is not appropriate or is not configured to make maximum utilization of technology. Additionally, staff uncertainty about the new technologies leads to initial confusion in roles, lack of focus in the curriculum target area, and negative perceptions about lack of incentives and burdens of time. Teachers need to broaden their view and perspective of technology in the curriculum. They need to create a new or enlarged context for the skills development that is necessary to make appropriate and meaningful uses of technology in the schools.



MEC is an education service agency for twenty-two school districts in the Merrimack Valley of Massachusetts and a charter member of AASA/AAESA, the organization of regional service agencies.

A Lighthouse Technology Model of the National Diffusion Network, U.S. Department of Education

Richard J. Lavin, Executive Director
Merrimack Education Center
101 Mill Road
Chelmsford, Mass. 01824
(617) 256-3985